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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/901,722	07/11/2001	Akihiro Hikichi	03327.2259	7732

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[REDACTED] EXAMINER

TORRES VELAZQUEZ, NORCA LIZ

[REDACTED] ART UNIT [REDACTED] PAPER NUMBER

1771

DATE MAILED: 03/03/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/901,722	HIKICHI ET AL. <i>(Signature)</i>
	Examiner Norca L. Torres-Velazquez	Art Unit 1771

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 11 July 2001.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-5 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____ .
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ . | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites “at least one kind of...” when referring to the different components of the friction material. While claiming specific formulas, it is not clear what other “kind” of these compounds exist. Applicant is advised to remove the word “kind” from the claim.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over COVALESKI (US 4,320,823) in view of KOLESOV et al. (SU 1740396 A1).

COVALESKI discloses a friction member of improved resistance to wear comprising aramid fibers impregnated with and bonded together by means of a heat-curable cement containing a vulcanizable, rubber which may be carboxylated, a water-soluble, one-step phenolic-type resin and friction modifiers. (Abstract) The reference teaches the use of a heat-

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curable cement system applied to the aramid fibers with a concentration of about 20 to about 80 percent friction modifiers. It further teaches the use of carbon black, graphite, metal oxides, metallic powders, barytes, clay, silica, alumina, cryolite, litharge and the like as friction modifiers and further the use of known organic fillers such as finely divided polymerized cashew nut oil. (Column 6, lines 15-38).

However, the reference does not disclose the concentration of the friction material components.

KOLESOV et al. discloses a solution for drilling gas and oil wells that contains ellipsoidal glass beads as additive reducing friction between walls of well and casing string.

The reference mixes the drilling solution with ellipsoidal glass beads that are chemically inert and have a chemical composition (in wt%): SiO₂ 61-61.5, CaO 18-18.5, Al₂O₃ 4.6-4.9, Na₂O 13.5-14, MgO 0.3-0.4, B₂O₃ 1.1-1.4 and K₂O 1.5-2.0. While the reference teaches that the beads are chemically inert and non-soluble in water and hydrocarbons, since these contain the same components as claimed herein, these are considered soluble as defined by Applicant.

Regarding claims 4 and 5, KOLESOV et al. teaches that the optimal shape and amount of glass beads have been found using empirical expressions, based on physical parameters of materials and working characteristics of well. The proposed ellipsoidal beads have higher mechanical resistance than spherically-shaped beads. The stress and load are reduced by 65% compared to those for spherical particles, and the contact area is increased by 4-5 times. (Abstract) Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use fibers with diameters in a range of from 2 µm to 9µm and average fiber length in a range from 100 µm to 1,500 µm, since it has been held that discovering

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an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Since both COVALESKI and KOLESOV et al. are from the same field of endeavor, friction materials, the purpose disclosed by KOLESOV would have been recognized in the pertinent art of COVALESKI.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the friction material of COVALESKI and provide it with chemically inert beads of the composition disclosed by KOLESOV et al. with the motivation of reducing the consumption of additive as disclosed by KOLESOV et al. (Abstract)

5. Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over ARAI (US 6,260,674 B1) in view of KOLESOV et al. (SU 1740396 A1).

ARAI discloses a friction material that contains a fibrous reinforcement, a binder, and a friction modifier. (Abstract) The reference teaches the use of heat-resistant organic fibers such as aromatic polyamide fibers, and flame-resistant acrylic fibers. It also teaches the use of inorganic fillers of metal particles such as copper, aluminum, zinc; particles of barium sulfate, calcium carbonate, and further teaches the use of synthetic rubber and cashew resin. ARAI teaches the use of phenol resin as a thermosetting resin binder. It also discloses the use of friction modifier including metal oxides such as alumina, magnesia, zirconia, chrome oxide, quartz.

However, the reference does not disclose the concentration of the friction material components.

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KOLESOV et al. discloses a solution for drilling gas and oil wells that contains ellipsoidal glass beads as additive reducing friction between walls of well and casing string.

The reference mixes the drilling solution with ellipsoidal glass beads that are chemically inert and have a chemical composition (in wt%): SiO₂ 61-61.5, CaO 18-18.5, Al₂O₃ 4.6-4.9, Na₂O 13.5-14, MgO 0.3-0.4, B₂O₃ 1.1-1.4 and K₂O 1.5-2.0. While the reference teaches that the beads are chemically inert and non-soluble in water and hydrocarbons, since these contain the same components as claimed herein, these are considered soluble as defined by Applicant.

Regarding claims 4 and 5, KOLESOV et al. teaches that the optimal shape and amount of glass beads have been found using empirical expressions, based on physical parameters of materials and working characteristics of well. The proposed ellipsoidal beads have higher mechanical resistance than spherically-shaped beads. The stress and load are reduced by 65% compared to those for spherical particles, and the contact area is increased by 4-5 times. (Abstract) Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use fibers with diameters in a range of from 2 µm to 9µm and average fiber length in a range from 100 µm to 1,500 µm, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Since both ARAI and KOLESOV et al. are from the same field of endeavor, friction materials, the purpose disclosed by KOLESOV would have been recognized in the pertinent art of ARAI.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the friction material of ARAI and provide it with chemically

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inert beads of the composition disclosed by KOLESOV et al. with the motivation of reducing the consumption of additive as disclosed by KOLESOV et al. (Abstract)

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

CHAPCHIKOV (SU 1770326 A1)

NITTO et al. (US 5,866,636)

BOOHER (US 5,495,922)

OKUBO et al. (US 4,446,203)

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Norca L. Torres-Velazquez whose telephone number is 703-306-5714. The examiner can normally be reached on Monday-Thursday 8:30-3:00 pm and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 703-308-2414. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

nlt
February 24, 2003

Elizabeth M. Cole
ELIZABETH M. COLE
PRIMARY EXAMINER